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ABSTRACT

ACTIVITIES REPORTED HEREIN INCLUDE STUDIES CONDUCTED, CONTRACTS, AND DEVELOPMENT GROUP WORK. TECHNICAL NOTES ARE PRESENTED CONCERNING THE DESIGN OF SCIENCE LABORATORIES FOR ASIAN SECONDARY LEVEL SCHOOLS; IT IS NOTED THAT CHANGED DESIGNS FOR CURRICULUM AND NEW METHODS OF TEACHING SCIENCE HAVE NECESSITATED NEW APPROACHES TO THE DESIGN OF SCIENCE LABORATORY FACILITIES. CONSIDERATION IS GIVEN TO LABORATORY ELECTRICITY, HEAT AND WATER SUPPLY, AND WORK BENCH DESIGN, FOR BOTH URBAN AND RURAL AREAS OF ASIA. ALSO INCLUDED ARE ABSTRACTS OF 12 JOURNAL ARTICLES CONCERNED WITH VARIOUS ASPECTS OF EDUCATIONAL BUILDINGS. (FS)

ED036077

Asian Regional Institute for School Building Research

Sponsored by Unesco

# BUILDINGS FOR EDUCATION

Vol. 2 No. 4

December 1968

COLOMBO

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# I. QUARTERLY REVIEW

## THE INSTITUTE'S ACTIVITIES, OCTOBER - DECEMBER 1968

*Technical Advisory Group Meeting:*

A meeting of the Institute's Technical Advisory Group, appointed by the Director General, Unesco, was held in the Institute on 4th, 5th and 7th of October, 1968.

The Group considered the Institute's programme, past and present and made recommendations for the Institute's programme for the bienium 1969-70.

Professor Mohan, Director, Central Building Research Institute, Roorkee, and a member of the group was unable to be present, but submitted his observations in writing.

*Cost Studies:*

A study of Cost and Space Utilization in Cambodian schools was undertaken by the Institute's Educationist and Cost Expert during October/ November. Later a seminar on second level school building in which the Institute's Research Architect also participated, was held in Phnom Penh. Secondary education in Cambodia is currently approaching an important phase of development in which diversification into three streams: arts, sciences with practical activities, and agriculture will soon take place. The need both to adapt the existing buildings and to design new buildings to facilitate this diversification formed a major topic of discussion at the seminar.

Secondary school building in Cambodia which is provided by local associations of parents and other interested persons, has made remarkable strides in recent years. By 1970 the number of secondary schools planned will double those at present existing. This will greatly contribute towards the country's economic development.

*Participation in the Course at the Asian Institute for Educational Planning and Administration:*

The Institute's Educationist and Cost Expert participated in the 1968 Course at the Delhi Institute.

*Regional Workshop on UNICEF/UNESCO Sciences Project in Asia:*

The Institute's Research Architect attended this two-week workshop, with Mr.P.Ratnayake, Chief Education Officer, Curriculum Development, Ceylon. Together they presented a paper entitled "An Approach to the Design of Chemistry Laboratories for Asian Secondary Schools" prepared by Mr.Jinapala

Alles and the Research Architect. The paper reported on the design approach to prototype chemistry laboratory formation and on the utilization of this furniture in a Ceylon school chemistry laboratory during 1968

*Development Group Work:*

In October on a mission to West Irian, Indonesia, the Development Group Advisor prepared a draft Plan of Operation for one of the UNDP/ Fund of the United Nations in West Irian projects, for which Unesco is executing agency, i.e. FUNDWI/3 for Model Schools. It is expected that a larger programme will develop from this pilot project.

The Development Group Advisor visited Japan and South Korea in November. Japanese progress in school building development was reviewed and some exchange of information on the subject of costs and school planning was made as well as arrangements for document exchange. In Korea, following consultation with a World Bank Appraisal Team, suggestions were made as to improving the school building development process, both centrally and rurally. It is entirely possible that a Development Group will be formed to assist in this process.

ARISBR is assisting E. Pakistan in a project for cyclone-resistant schools. A visit to Dacca is scheduled for January, 1969 to develop the project further. Some 350 buildings are likely to be involved.

*Contracts:*

1. *Illumination study*

   The measurements of luminance and availability of daylighting at 5 stations in Asia, undertaken by the Central Building Research Institute, Roorkee, under contract to ARISBR, has now commenced. These measurements will continue for one year.

2. *High rise schools study*

   The High Rise Schools Study undertaken by the Singapore Polytechnic, Atelier Akitek, under contract to ARISBR, has now been completed and agreement reached on the preparation of material for publication in 1969.

3. *Design of industrial arts facilities for Asian secondary schools*

   A consultant, Mr. Khurshid A. Khan, University of the Punjab, worked in the Institute in Colombo for six weeks in collaboration with the Institute's Research Architect on a study of the design of industrial arts facilities for Asian secondary schools. The study will be published in 1969.

## *II - TECHNICAL NOTES*

### *AN APPROACH TO THE DESIGN OF SCIENCE LABORATORIES FOR ASIAN SECOND LEVEL SCHOOLS*

It has been said that "no problem is so familiar, its traditional solutions so proven, that it can escape reassessment from every viewpoint".* This is particularly so in the case of laboratory design for future Asian schools. Chemistry, Biology, and Physics teaching are now undergoing a revolution both in respect of changing curriculum content and changing teaching method.

In the past, science teaching has been pursued at the second level in many Asian countries purely as an introduction to later programmes of professional study in subjects such as medicine, engineering, and the like. Now science teaching is coming to be thought of as part of the general education of secondary school students and is being increasingly oriented to a broadening of the general concepts of culture. It is acknowledged that there is no longer a need only to prepare students for third level education, but also to provide a good scientific background for those whose education is terminal at second level.

An important aspect of this changing situation is the significantly larger number of children pursuing general education and the resulting larger numbers moving on to programmes of higher education. This leads to a need to review the objectives of science teaching in relation to the wider spectrum of abilities that is now found in the secondary schools.

Traditional science teaching has been regarded in the past as a body of factual knowledge to be remembered. There has been a tendency to pass over the basic concepts of science in the hurry to broaden the scope of the material to be learned. Much learning under the old system was inevitably of the "rote" pattern. Subjects such as chemistry tended to be relatively "glorified cookery sessions", where preparations and analysis were carried on in a routine manner with little meaning. The old laboratories in all three sciences have been evolved essentially to meet these traditional methods of teaching. Despite this, outstanding pupils have emerged as the result of the work of individual and devoted teachers, but in general the standard of learning in the sciences under the traditional methods may be regarded as low.

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*MIDDLETON, M. Group practice in design. London, Architectural Press, 1968.

The new methods of teaching science of which the Australian, British and American schemes and the schemes *inter alia* of Ceylon, China and the Philippines are well known in Asia, seek to change the old systems of learning described above. The changed emphasis is now not on rote learning but rather on *how* to learn or, as it is so often described, "learning to learn". The stress is now on abilities and attitudes such as independent thinking, individual work. This has resulted in changed designs for curriculum and also in changed attitudes of the teachers, involving reorientation in such a way as to be able to assist and participate with students in searching for the wider objectives of science learning.

These changes in modern science teaching require new approaches to the design of the physical plant, which will support teacher and pupils in attaining the new objectives. The new play cannot easily be played with old scenery. Students are now required to work in small groups at relatively open-ended experiments. There needs to be a wider variety of resources in the laboratory and above all the teacher must be able to make himself "disappear" as the person who knows, and merge with the student groups as a co-worker in seeking answers.

The traditional laboratory represents in fact a very satisfactory design response to a teacher-centric situation in which the student, arranged in rows to face in one direction, are required to observe an experiment and then to repeat it themselves at their own work stations.

It should be said at this point that there continues to be a need at appropriate stages - carefully predetermined by the teacher - for demonstration work, and teaching by chalk and talk. However, this will be nothing like as great as in the past and must now be supplemented by periods during which the teacher is working with the children either inside the laboratory or outside. On rare occasions there may be no need for the teacher at all.

Coupled with these rather general considerations, there must be a examination of the laboratory design problem in relation to the detailed curriculum. At present, most new laboratories are provided with heavy benches, water supply, electricity and gas. Where gas and electricity and water are not available then the practice is usually to install expensive pumps, gas and electricity generators. The expense of laboratory provision is at present one of the main difficulties in the spread of science teaching throughout the Asian Region. In this context it is worth remembering that over 70% of Asian secondary school children live in rural areas where there is rarely running water, very frequently no electricity and hardly ever any gas. The point of departure from the design of laboratories for urban areas in considering their design for the vast rural areas of Asia must be careful consideration of these factors.

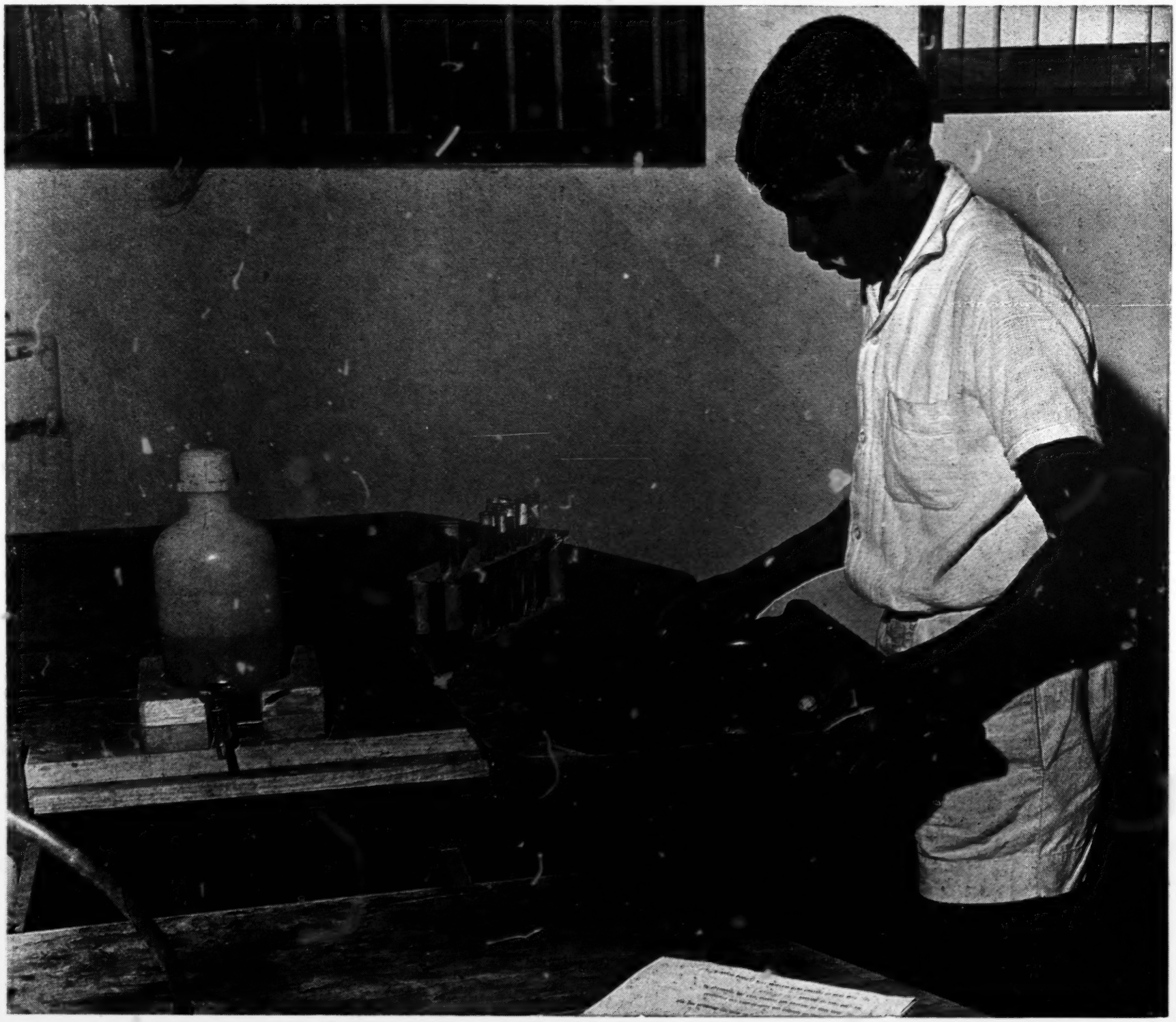


PLATE I – Water - Storage and Disposal at a Newly Designed
2-Group Chemistry Bench for Rural Areas

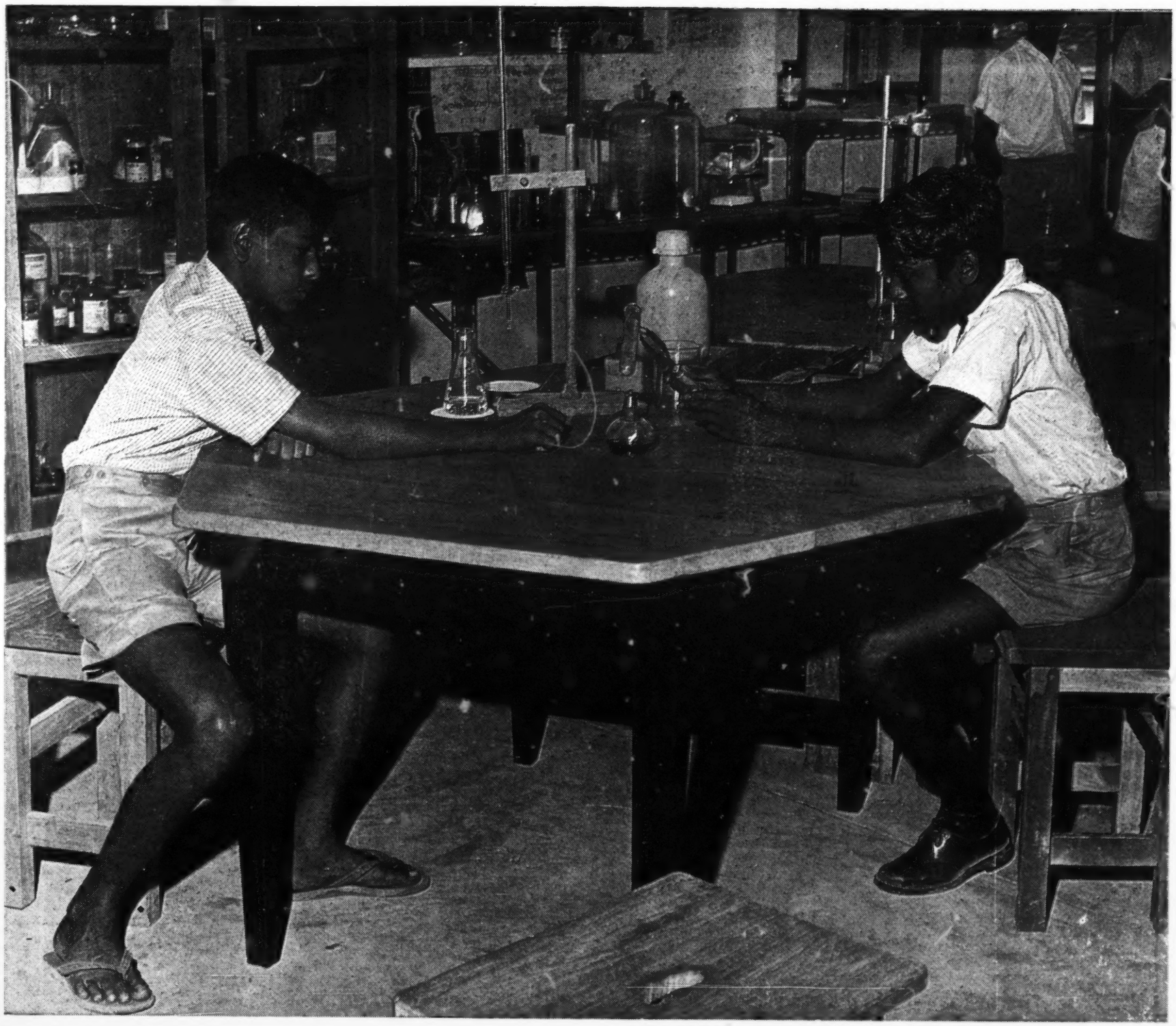


PLATE II – Simple Heating Method Using Spirit Lamp.
Students can Sit or Stand comfortably at Tables

Studies in the Asian Regional Institute for School Building Research have shown quite clearly that in the case of all three types of laboratory, electric power and heat can be simply provided without recourse to either main electricity supply or to expensive gas generators. Primus stoves, kerosine oil heaters and spirit lamps, can be used to provide heat, whilst nickel-iron accumulators provide electric current quite satisfactorily *(see* Plate IV*)*. So far as water is concerned, it seems certain that in the case of physics and chemistry, running water is not a necessity. Furthermore in the case of Chemistry, with a maximum consumption of 16 litres per term, per teaching group, it seems that not only is there no need for running water but also that an expensive drainage system is dispensable.

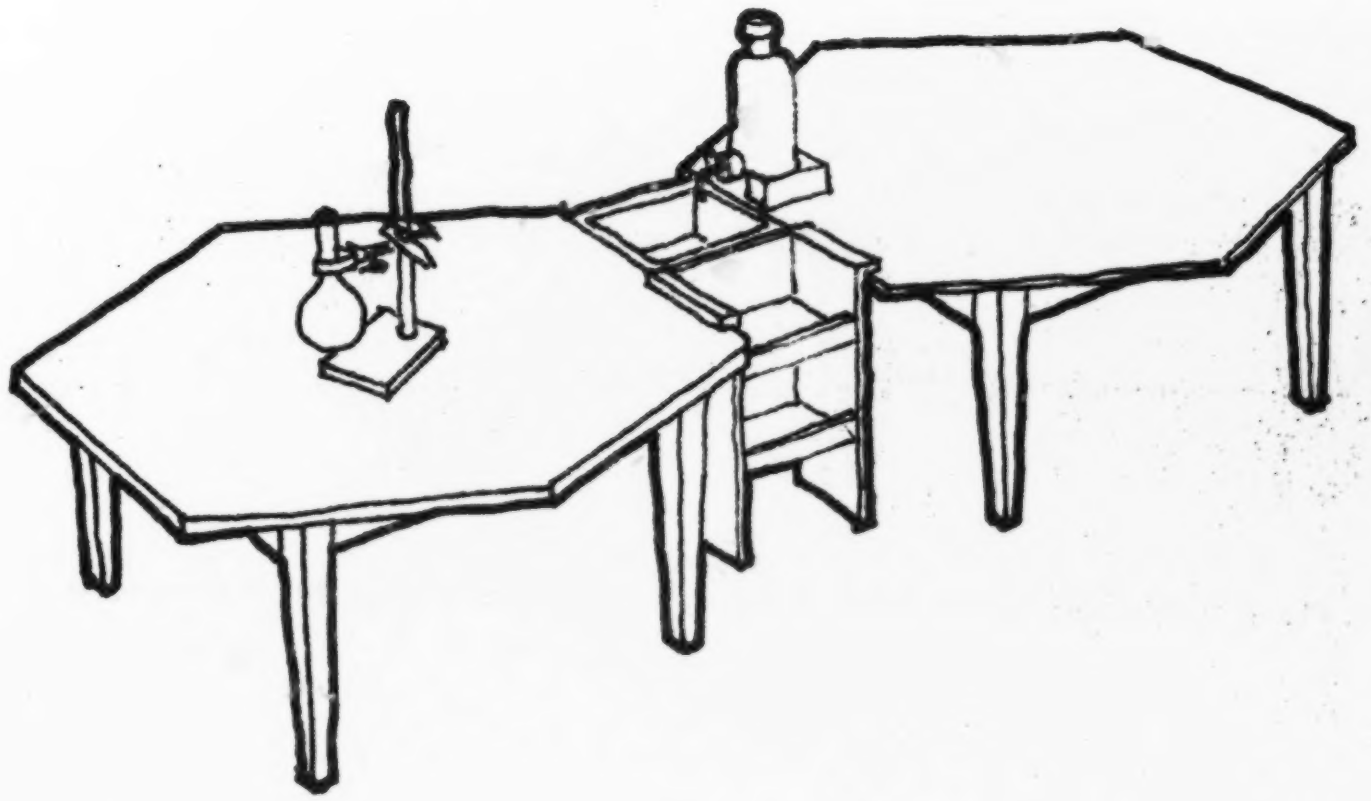


*Fig.1 - Chemistry Table*

Plate I shows a simple two-group chemistry bench at which water is stored in a 3-litre aspirator and waste is collected in a light plastic sink, the contents of which could be thrown away by a single child at the end of every lesson. Similar arrangements could be made for physics and for biology laboratories.

Plates II & III show simple means of heating using spirit lamps and the plates also incidentally draw attention to the trend in chemistry teaching which is towards experimentation at test tube scale. Semi-micro scale chemistry has already been introduced in several countries.

Plate IV, which shows a simple, four-place physics bench, also indicates how easy it is to provide electricity in the laboratory without the introduction of main power supplies.

The problems of the design of chemistry, physics and biology laboratories in the Asian Region are dealt with more fully in Study nos. 2, 3 and 4 already published or in process of printing by the Asian Regional Institute for School Building Research. Working Drawings of the new prototype science laboratory furniture in this paper are available free on application to the Institute.

The drawings, which are available in both inch and metric units, have been prepared for Ceylon schools, but they may well stimulate thinking in other countries.

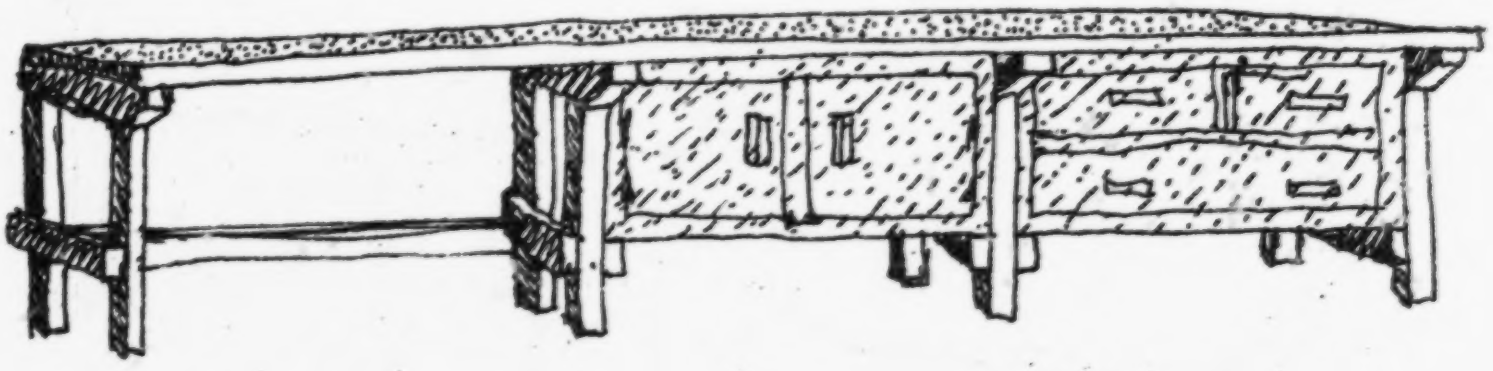


*Fig.2 - Biology Bench with drawer and Cupboard Units Interchangable*

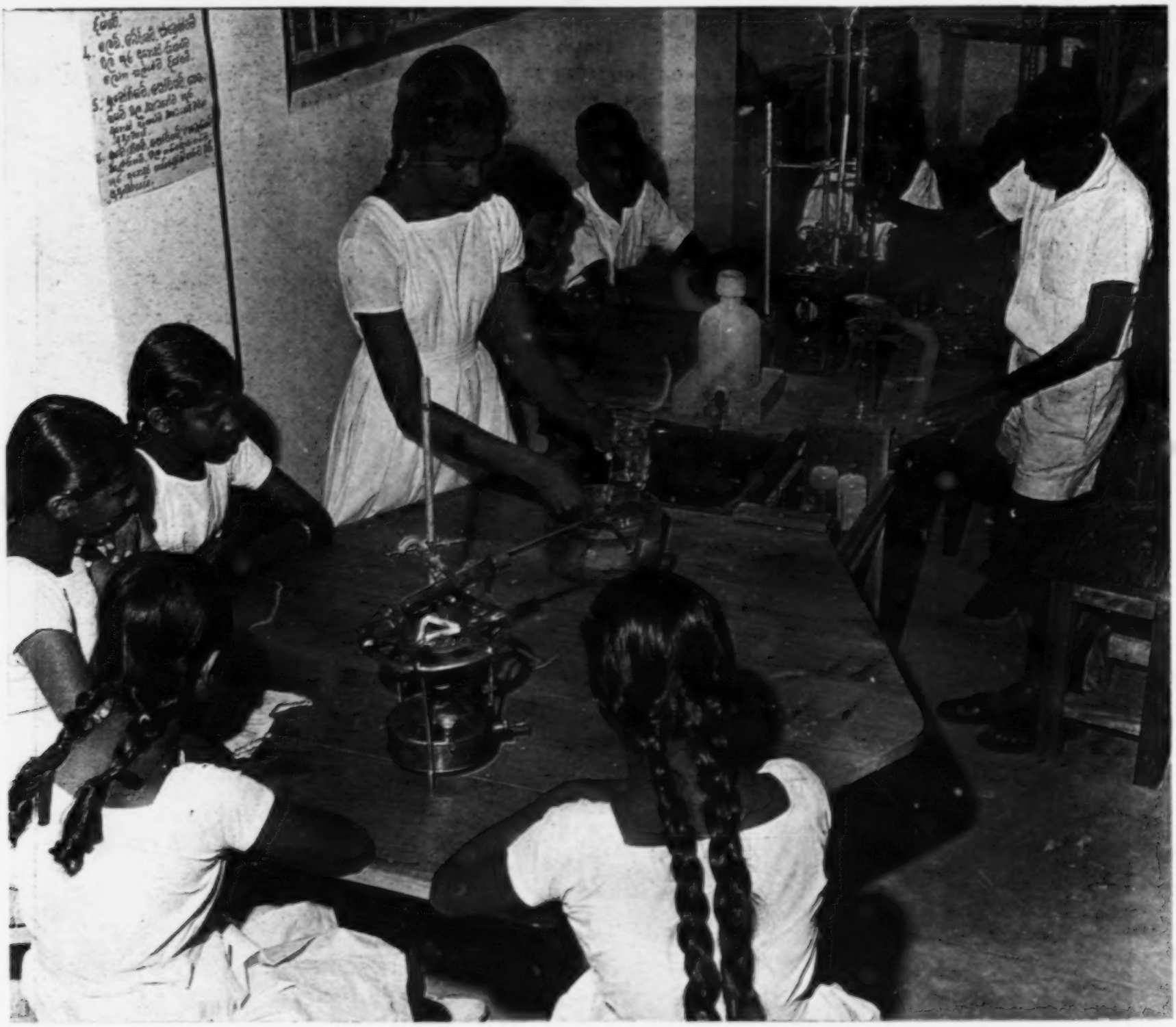


PLATE III - Simple Spirit Stove for Heating
Note also the Battery for Power Used by the
Experiment conducted by Students in the Background.

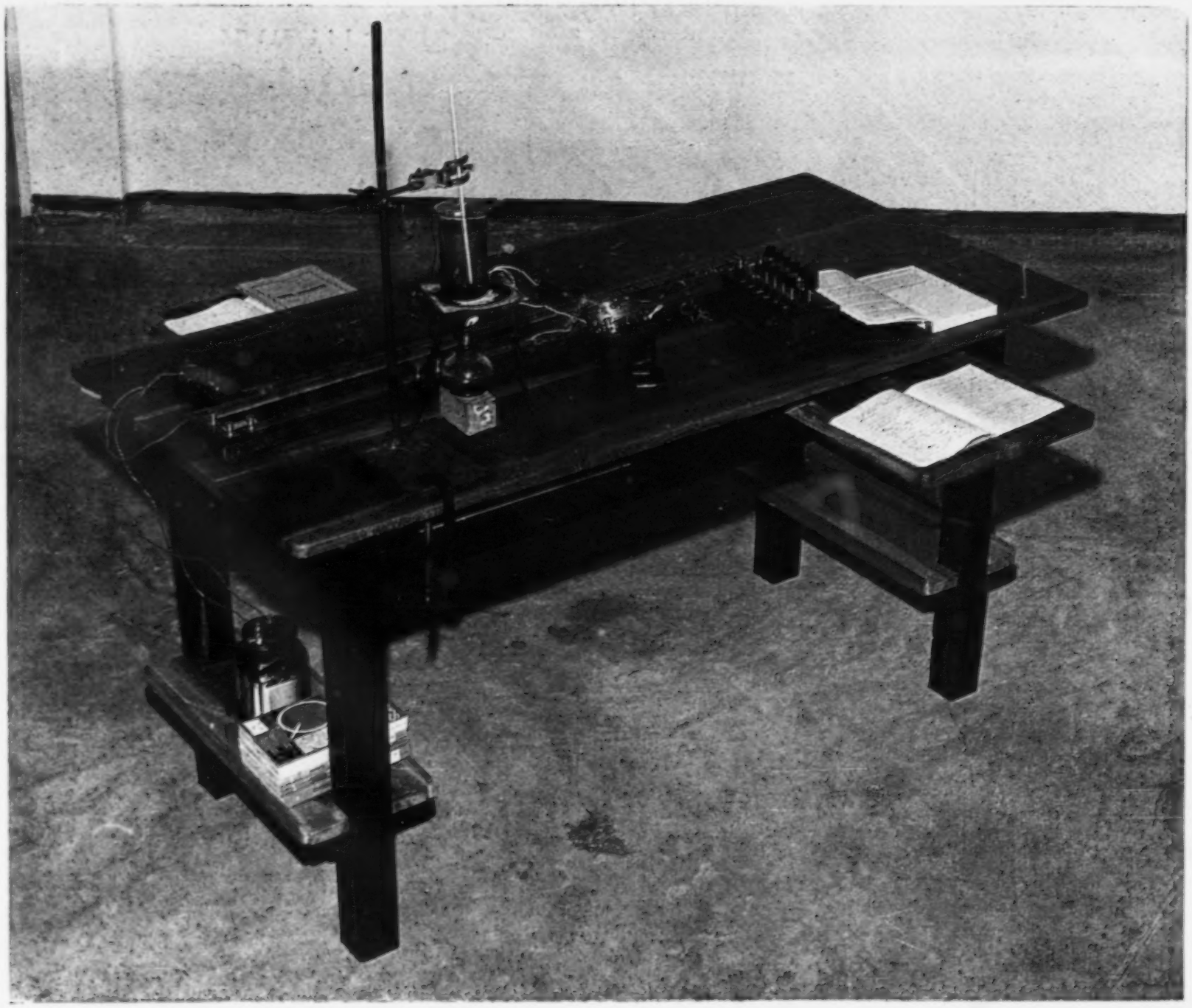


PLATE IV - 4-Blace Physics Table Showing Simple Means of Providing Power and Heating Devices.

## *III - EDUCATIONAL BUILDING ABSTRACTS*

### *Aa1 - INFORMATION*

106. ARCHITECTS' personal and office libraries. *Architects' journal* v.148, no.32-5 (7-28 Aug) 1968, p.257 - , illus., bibl.

This series of articles by various contributors surveys the types of library service which an architect might require either as a personal library or in his practice. The information covers not only a manual of procedure for running an office library, but also gives advice to the architect on the whole question of whether or not his office should support a full-sized architectural library. It mentions several private and professional services now operating in England which give support to small architectural offices, advising them on their library needs, preparing plans of library services, supplying literature of various types, and even in certain cases training office staff of service small libraries without the aid of a professional librarian.

The articles are profusely illustrated with the latest in library equipment, calculated to turn the Asian architect slightly green with envy at the ease with which the London architect can call upon a variety of products to suit his needs. Nevertheless in its commonsense approach to the vital question of whether or not a library is required, how big it should be, the probable cost involved in various levels of library service and the actual procedure for running a library it is a most valuable series of articles, which, put together in booklet form should aid the Asian architect to set up a successful and useful collection.

107. KAYSER, ROSMARIE. Educational building documentation; a guide for the establishment of educational building documentation units in Africa. Khartoum, Regional School Building Centre for Africa, 1968 . 34p., bibl. Available free from the Centre at P.O.Box 1620, Khartoum, Sudan.

In the last issue of this newsletter, *Buildings for Education*, v.2, no.3 appeared ARISBR's article on the establishment of small educational building

*Aa1 - INFORMATION (contd.)*

107. KAYSER, ROSMARIE. Educational building documentation; (contd.)

department libraries. This manual, prepared by the Documentalist supplied by Unesco to the Regional School Building Centre for Africa gives in greater detail the purposes of a Documentation Unit, and considerably more on the techniques of cataloguing and classification of the material in such a Unit. It is illustrated with equipment which is cheap to buy and/or easy for a small department to design and construct for itself. A French edition of this booklet will be produced shortly, and copies of the English edition are available free from the Documentalist at the above address.

108. UNITED NATIONS. *Economic Commission for Africa.* The keeping of documents in small and medium size building information centres; an advisory pamphlet for developing countries. n.p., n.d. 23p., loose appendices.

This pamphlet is a useful adjunct to Mrs. Kayser's booklet on *Educational building documentation* abstracted as item 107 of this issue. A short introduction to methods of keeping documents is followed with detailed information on the SfB/UDC Building classification. It also contains exercises for short courses for officers required to undertake the care of such a centre. Loose appendices contain samples of book cards used in some types of libraries (through for small libraries these are often more work to maintain than they are worth) and details of how to label books and library furniture so that readers can gain confidence in using the collection on their own.

*Aa7 - EDUCATION*

109. DICKIE, R. A. Iran's schools under canvas. *Unesco features,* no.527/528 (May/Jun) 1968, p.12-13. Obtainable free from: Unesco, Place de Fontenoy, Paris 7e.

In an attempt to prepare the children of the nomadic tribes for the social changes consequent to their rehabilitation in settlement, Iran started,a few years ago, to provide schools that move with the tribes.

*Aa7 - EDUCATION (contd.)*

109. DICKIE, R. A. Iran's schools under canvas. (contd.)

These tribal schools - most of them in the Province of Fars, where the system was originally started - are conducted in *white* tents in contrast to the black tents in which the tribes live.

Each school has an average of 30 boys and girls. The simple equipment consists of chalk-board, a folding chair, a map of the world and a few text books. There are about 600 such schools providing education to about 24,000 children.

The teachers themselves are tribal men and women who, after one or two years of secondary education are given a special training in teaching. A modern training centre is established at Shiraz, the capital of the Province of Fars, providing accommodation for about 100 men and 30 women. In service training and demonstration classes are conducted at this centre.

The white tent school has a long school day from 7.30 a.m. - 11.30 a.m. and 2.00 p.m - 6.00 p.m. but the atmosphere of freedom and security present in these schools enable the children to work without fatigue.

A special feature of this system is the close association of the parents with the school, which has in a way brought about a measure of literacy among them.

The white tent school has proved its worth, and the system is to be extended to more tribal groups during the forthcoming five year plan.

Photographs of these schools are also available from Unesco at the address shown in the bibliographical caption to this article.

*Ba6 - INDUSTRIALISED BUILDING, SYSTEMS, COMPONENTS*

110. COMPLETE integration of secondary elements. *Interbuild*, v.13, no.12 (Dec) 1966, p.12-14., illus.

This is a report on a new system for school building in pre-cast reinforced concrete components. The outstanding feature of this building is the com-

*Ba6 - INDUSTRIALISED BUILDING, SYSTEMS, COMPONENTS (contd.)*

110. COMPLETE integration of secondary elements. (contd.)

plete integration of all secondary elements into the system, including light fittings, cupboards and blackboards.

The structural system is based on pre-cast concrete columns and beams that interlock mechanically and with a waffle plate floor that is hung from the beams. The external walls are concrete panels of sandwich construction that hang on the rest of the structure while the window elements in timber and concrete fit between the columns.

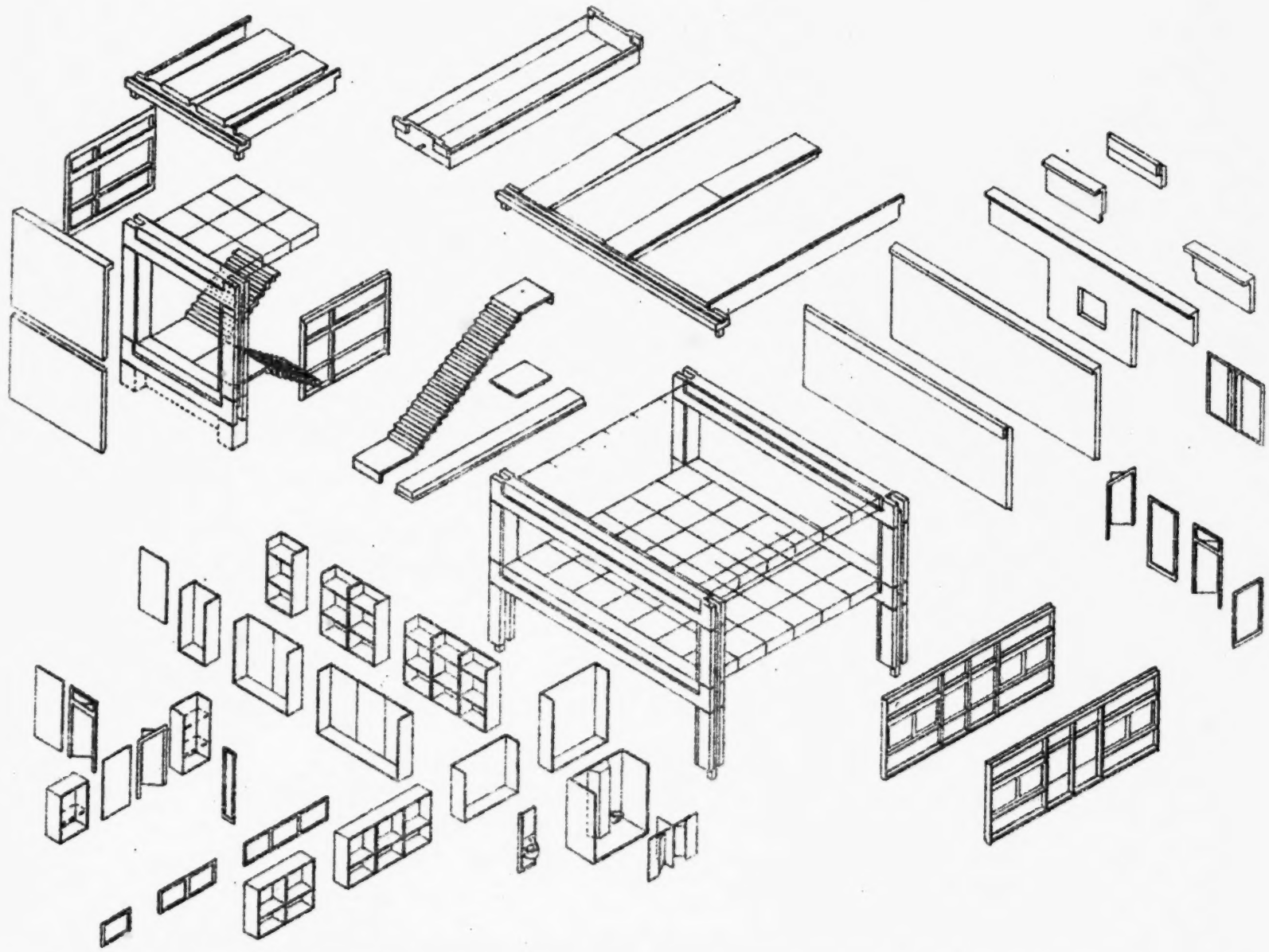
The joints between the structural members are thought of as simple mechanical interlocking pieces that hold themselves in position during construction and are finally grouted with additional steel to ensure structural stability.

Materials are left in their natural state, the very high standard of finish of the concrete permits it to be left untreated and the timber windows are varnished. Internal doors and the cupboard doors are painted, some in gay colours.

The partitions between classrooms consists of cupboards made in pre-cast concrete fitted with timber doors. They fill up the module between columns and provide good sound insulation between classrooms.

*Ba6 - INDUSTRIALISED BUILDING, SYSTEMS, COMPONENTS (contd.)*

110. COMPLETE integration of secondary elements. (contd.)



Axonometric of the Peikert elements. The principal structural elements are shown assembled with the staircase elements behind. The wooden roof structure is above, and the many variations of external panels are shown. Cupboard elements are also in concrete

The system has been developed by the Swiss firm of Peikert. The Development Architect, Romeo Stander and the Engineer W. Ruprecht. Peikert spent two years on research and development of the system. The architect wanted to develop a fresh and more logical approach to the problem of school planning, while the manufacturers were interested in a system that used precast concrete for as many elements as possible. In this way they have achieved complete control over the constructional system and can offer a package deal.

*(97) - EDUCATIONAL BUILDINGS*

111. A BIG comprehensive high school uses a new "300" plan. *Architectural record*, v.140, no.10 (Oct) 1967, p.180-181, illus.

Maine Township (U.S.A.) decided that a large four-year school of 3000 students would be the most suitable way to provide facilities for its educational programme. In the design of its South High School, therefore, Maine attempted to reconcile the "best qualities of smallness with the best features of largeness" in an educational building.

This has been done by dividing the entire student body into groups of about 300. Each group has a home base including a guidance unit, facilities for individual study, conference room for seminars, separate entrances and dining rooms. Students are expected to spend from 35 to 50% of their time in these "house" areas.

This is one article in a series on school buildings published as Building Types Study 376 in this issue of *Architectural record*.

112. BOSHEARS, ONVA K. The residence hall library. *Wilson library bulletin*, v.42, no. 8 (Apr) 1968, p.829-833, illus., refs.

One of the difficulties of very large universities is that of encompassing the smaller and more individualised structures and forms of organisation that are preferred by many students and teaching staff.

Michigan University has endeavoured to provide a focal point for smaller student groups within the multiversity through residence hall libraries. These libraries which are quite distinct from the main university library, are located in the 12 residence halls. The libraries vary in size and facilities depending on the number of residents in the halls. The largest library has a current collection of approximately 2500 and shelving capacity for 4000 books. It also holds 1100 gramophone records and has 70 periodicals and newspaper subscriptions. The library, with a seating capacity of 50, has a separate adjoining study hall which can also accommodate 50 students. The library serves a student constituency of approximately 1170 students.

*(97) - EDUCATIONAL BUILDINGS (contd.)*

112. BOSHEARS, ONVA K. The residence hall library. (contd.)

These libraries are centrally co-ordinated by a professional librarian and directed by student librarians. They provide residents with a pleasant and enjoyable opportunity for reading, browsing, group discussion and for music and are appreciation within a relaxed environment. They serve as an intellectual centre of the residence hall and a focal point of organisation for a wide range of non-curricular activities.

113. BULLOCK, NICHOLAS. A theoretical model for university planning by N. Bullock, Peter Dickens and Philip Steadman. *Universities quarterly*, v.22, no.2 (March) 1968, p.124-141, bibl.

"The simpest function of a mathematical model is to *explain*, in some sense, the present situation".* In this context the situation is that of the relationship of university student numbers to amounts of building and to the use of land. The model described in this paper attempts specifically to establish a comprehensive series of mathematical relationships between the different parameters which affect the physical aspects of university planning. It will provide information on the present use of buildings and sites as well as on the implications in physical terms of future expansion in student numbers.

The model falls into two parts, the first relating population to floor area, building volume and land area. The second part involves consideration of activity patterns, movement and form and layout of buildings. The study includes in respect of these two aspects, consideration of teaching, research and living accommodation.

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* ARENA, v.82, no.119 (April) 1967, p.261. (Quoted in the article abstracted above.)

*(97) - EDUCATIONAL BUILDINGS (contd.)*

113. BULLOCK, NICHOLAS. A theoretical model for university planning. (contd.)

The relationships are described in a network drawing. The paper includes comments on new patterns of teaching, forms of building residences, wastage and urban scale as they affect the construction of the model. Work on the topic is continuing and the finding will be published in an interim report.

114. FERENDINO, A. J. High honors for the educational park. A I A school plant study, BT 1-62. American Institute of Architects. *Journal*, v.47, no.6 (Dec) 1967, p.52-4, illus.

In its simplest form an educational park can be described as the massing of large groups of students on a single site. Certain patterns of educational park development are now emerging:-

1. Horizontal plan - a single school with many students from the same level;
2. Vertical plan - a single first-level and second-level school, each level moving out as would the pupils from a correspondingly larger geographical area;
3. Pyramid plan - one high school, several junior high schools and many elementary schools drawn from one zone and consolidated on one site;
4. Other plans - junior colleges, community school programmes, vocational and adult programmes.

The advantages of an educational-park-type school are that it can provide through its larger staff a higher quality of teaching; through mass purchasing and centralised delivery many savings can be achieved. The objections to the park concept are that it will destroy the neighbourhood school removing the children beyond a walking distance from the school buildings and removing the school from the parent and communal activities which are normally associated with school units. Those in favour of the park, feel that the larger geographical area served helps to extend the view of the child, which in a neighbourhood school is limited to a few blocks. There is no doubt that transportation of children from a large catchment zone will present problems.

*(97) - EDUCATIONAL BUILDINGS (contd.)*

114. FERENDINO, A. J. High honors for the educational park. (contd.)

It is in the educational field, however, that the park offers the greatest advantages for it will afford greater opportunities for more groups according to the individual child's level of achievement and the new concept of education brought about by the introduction of educational parks should breed new architectural concepts. Educational parks should be places where the brilliant scholar as well as the slower learner can find equal challenge to their respective abilities.

115. GIBSON, CHARLES D. How "flexible" are your schools? *School management*, v.11, no.11 (Nov) 1968, p.110-125, illus.

Any definition of flexibility must convey the idea of movement. Although a good definition does not appear at present to exist, this has not inhibited both architects and educators from writing and talking a great deal about the topic.

The present article endeavours to quantify the specific characteristic of the building through the use of flexibility rating reports. In the flexibility rating table are given maximum possible scores and against each an objective judgement as to the flexibility characteristics can be made.

The elements considered are spatial, thermal, visual and acoustic and finally furniture and equipment. The article includes a worked example.

As with most scoring systems of this type, no provision is made for a zero score on the basis of one element, the nature of which would destroy the entire concept under consideration. For example, if all chairs and tables were permanently and immoveably fixed to the floor a building could still get a quite high flexibility rating through attaining high scores for spatial, thermal,visual and acoustic flexibility. This is an inherent difficulty in such rating systems which needs resolution.

*(97) - EDUCATIONAL BUILDINGS (contd.)*

116. SAINI, B. S. Buildings for education. *Arena/interbuild*, v.83 no.920/v.15, no.2 (Feb) 1968, p.20-3, illus., bibl.

In this article, Mr. Saini, Senior Lecturer in architecture at University of Melbourne discusses the design of college and schools in the Territory of Papua and New Guinea in the light of the Territory's educational aims. The administration has built many primary schools but secondary and tertiary facilities have lagged behind. More attention is likely to be given to these in the future, it is pointed out. The Authorities started their crash programme to overcome illiteracy with the use of skeleton steel structures; this was later changed to more complete units to accommodate higher teaching standards.

Analogy is drawn between Mexican, West African and New Guinea situations, design approaches are discussed, land use commented on and building amenities reviewed.

Reference is made to anthropometric studies published by ARISBR and the need for similar studies among New Guinea's varied population. The article is a digest which of interest to those building schools in remote areas, but other documents by Mr.Saini concerning New Guinea are far more comprehensive and are recommended for closer study.

*(98) - RESIDENTIAL BUILDINGS*

117. HOSTEL planning; current trends in design. Technical study. *Architects' journal*, v.147, no.18 (1 May) 1968, p.981-8, illus.

Increasing prosperity has made families less inclined to take in university students merely for the sake of money. At the same time lodgings in private houses lack privacy and obstruct the freedom now desired by young people. This coupled with the growing number of students at universities and technical colleges poses a problem for those requiring living accommodation.

*(98) - RESIDENTIAL BUILDINGS (contd.)*

117. HOSTEL planning; current trends in design. (contd.)

The most desirable accommodation for the majority of students is thought to be in the form of self-contained flats or houses, but this is too expensive. Hostels of the traditional kind are uneconomic to run and no longer meet the needs of the students who also find them to be lacking in privacy and flexibility. The article describes a number of new developments in hostel design which reflect the students' changing attitude to their housing and provide cheaper solutions than those afforded by the provision of flats. The new proposals include flatlet-type hostels for each person, double flats sharing a bathroom, cluster flats in the form of self-contained dwellings and individual units with communal facilities. The article is extremely well illustrated with plans of the different types of accommodation described.

*Page*

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*Note:* The Indexes refer to abstracts by number throughout the whole of V.2 of *Buildings for Education.*

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Journal.
The Octagon,
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International Union of Testing and Research Laboratories for Materials and Structures,
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Quarterly. Ceased with no.37 Dec.1967.
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COMPARATIVE education review.
Official Journal of the Comparative Education Society,
525 West 120th St.,
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*LIST OF PUBLICATIONS PREPARED BY THE INSTITUTE AND AVAILABLE WHERE INDICATED*

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*Publications for General Distribution:*

*[A]Occasional papers, school building*

*no. 1 Climate and school building design in Java. (Out of print)*
*2 The shading of school buildings in South-East Asia. sun-shading diagrams. (Out of print)*
*3 Comparative anthropometric data: A - for use in Indian schools.*
*4 Comparative anthropometric data: B - for use in Thai schools.*
*5 Comparative anthropometric data: C - for use in Indonesian schools.*
*6 Comparative anthropometric data: D - application of data.*
*7 A comparative study of multi-purpose rooms in educational buildings.*
*8 Comparative anthropometric data: E - for use in Philippine schools.*
*9 Environmental control in school buildings through planting.*
*10 Primary school buildings in Asia. administration, facilities, programmes.*
*11 School building development group work.*
*12 A primary school design workbook for humid Asia.*
*13 A method of reducing classroom requirements in primary schools in Asia.*

*[A]nos. 1 & 2 have separate French editions. nos. 7 & 9 are available in Indonesian from: The Director*
*Pusat Penelitian Gedung2 Sekolah,*
*Djl. Tamansari 124, BANDUNG, Indonesia.*

*Comparative Anthropometrics for Use in East Pakistan Schools.(Out of print)*

*Studies:*

*no. 1 The design of home economics laboratories for Asian second level schools. (in press)*
*[AA]2 The design of biology laboratories for Asian second level schools.*
*[AA]3 The design of chemistry laboratories for Asian second level schools.*
*4 The design of physics laboratories for Asian second level schools.*

*[AA] For 1969 publication.*

*Quarterly Newsletter:*

*Buildings for Education, v.1: nos. 1, 2, 3, 4. (1967)*
*v.2: nos. 1, 2, 3, 4. (1968)*

*Annual Reports*
*1967*

*Information bulletin, 1967*

*The following papers have been prepared by the Institute and are available on a restricted basis:*

*Reports to Government (Confidential)*

*A Study of the Utilization, Design and Cost of Secondary Schools in Ceylon; report to the Minister of Education and Cultural Affairs, Government of Ceylon. Colombo, 1967.*

*Reports to Government (Confidential)* contd.

*A Study of the Utilization, Design & Costs of Second Level Schools in Iran; an interim report to His Excellency the Minister of Education, Iran. Colombo, 1968.*

*A Study of the Utilization, Design and Costs of Secondary Schools in Delhi State, India; a report to the Director of Education, Delhi. Colombo 1968.*

*The Primary School Building Programme, East Pakistan with Special Reference to Cyclone Affected Areas; a report and recommendations to the Director of Public Instruction. Colombo, 1968.*

*Recommendations to the Government of East Pakistan concerning Educational Building Development Organisation and Establishment of a Development Group. Colombo, 1968.*

*Seminar Papers (Restricted):*

*Seminar on the Design of Schools for Ceylon, Colombo, 17-20 May, 1967. Papers. Colombo, 1967.*

*Seminar on the Design and Costing of Second Level Schools, Phnom Penh, Cambodia, October, 1968. Papers. Colombo, 1968.*

*Design of Primary School Buildings. Papers prepared for the Third Institute for Key Teacher Educators, Quezon City from 2nd to 4th September, 1968. Colombo, 1968.*

*Investment in Educational Buildings; Implications of Educational Planning & Administration on the Design & Costing of School Building. Papers prepared for the 9th Planning Course of the Asian Institute of Educational Planning and Administration New Delhi, October, 1968.*

*An Approach to the Design of Chemistry Laboratories for Asian Secondary Schools; prepared... for the Regional Workshop of Unesco/Unicef - Assisted Projects in Science Education in Asia. [Held November 1968] Colombo, 1968.*

*Preliminary Papers (Restricted):*

*A Work Plan for a National School Building Development Group. Colombo, 1968.*

*Bibliographies (Limited):*

*Bibliography on Anthropometrics and School Furniture Design and Bibliography on Thermal Comfort. Colombo, 1968.*

*Accession Lists (Generally Available):*

*No. 1 - 15 (nos. 2 - 4 & 6 out of print).*